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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,448	04/01/2004	Soon-Hong Ahn	8021-227 (SS-19246-US)	7782
22150	7590	02/14/2006	EXAMINER	
F. CHAU & ASSOCIATES, LLC 130 WOODBURY ROAD WOODBURY, NY 11797			LE, THAO X	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 02/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Ali

<b>Office Action Summary</b>	<b>Application No.</b> 10/815,448	<b>Applicant(s)</b> AHN ET AL.	
	<b>Examiner</b> Thao X. Le	<b>Art Unit</b> 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 January 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date: _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-10, 12-17, and 19-24 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 6690067 to Ker et al.

Regarding claim 1, Ker discloses a semiconductor device in fig. 3b comprising: a first well (left N-well) connected to a pad, fig. 3b, to which an external pin is connected, the first well including a first-type diffusion region N+ that receives a well bias voltage, a second well adjacent to the first well, a second well (second well comprises P-substrate in both side of middle N-well) including an insulating region (middle N-well) and at least one second-type diffusion region P+ outside the insulating region, fig. 3b; and a third well (right N-well) adjacent to the second well and including a first-type diffusion region N+

that receives a first voltage, fig. 3b, wherein the insulating region inside the second well along with the first-type diffusion N<sup>+</sup> region of the first well constitute a bipolar junction transistor, which cuts off current flowing from the first well to the third well.

The recitation of 'cuts off current flowing from the first well to the third well.' is only a statement of the inherent properties of the product. The structure recited in the Ker's reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

With respect to second well, the substrate is a P-type substrate, i.e. lightly dope; thus substrate would be interpreted as a well.

Regarding claim 2, Ker discloses the semiconductor device, wherein the at least one second-type diffusion region outside the insulating region comprises a first second-type diffusion region and a second second-type diffusion region, and the second well comprises: a first sub-well arranged (P-substrate) between the insulating region (middle N-well) and the first well (left N-well) and including the first second-type diffusion region P<sup>+</sup>; and a second sub-well arranged between

(P-substrate) the insulating region and the third well (right N-well) and including the second second-type diffusion region P+, wherein the insulating region (middle N-well) is a third sub-well having a first-type diffusion region (N).

Regarding claim 3, Kerr discloses the semiconductor device wherein the first and second sub-wells (left and right P-substrate portions of middle N-well) of the second well are P-wells, and the first voltage is applied to the second-type diffusion regions of the first and second sub-wells of the second well, fig. 3b

Regarding claim 4, Kerr discloses the semiconductor device wherein the third sub-well (right N-well) is an N-well, and a second voltage is applied to the first-type diffusion region of the third sub-well, fig. 3b.

Regarding claim 5, Kerr discloses the semiconductor device wherein the first voltage is a ground voltage, and the second voltage generates a backward voltage between a base and an emitter of a bipolar junction transistor, the bipolar junction transistor comprising the first-type diffusion region N+ of the first well, the second-type diffusion region P+ of the first sub-well, and the first-type diffusion region N+ of the third sub-well.

Regarding claim 6, Kerr discloses the semiconductor device wherein the first (left N-well) and third wells (right N-well) are N-wells, fig. 3b.

Regarding claim 7, Kerr discloses the semiconductor device wherein the well bias voltage applied to the first-type diffusion region N+ of the first well is a power supply voltage, fig. 3b

Regarding claim 8, Ker discloses the semiconductor device wherein a region to which the pad is connected is a second-type diffusion region P+, fig. 3b.

Regarding claim 9, Kerr discloses the semiconductor device wherein the first-type diffusion regions are formed of N-type impurities, and the at least one second-type diffusion region is formed of P-type impurities, fig. 3b

Regarding claim 10, Kerr discloses the semiconductor device wherein the insulating region (middle N-well) of the second well has a structure that surrounds the first well to view in fig. 3b.

Regarding claim 12, Kerr discloses a semiconductor device in fig. 3b comprising: a first N-well connected to a pad to which an external pin is connected, the first N-well (left N-well) including an N-type diffusion region N+ that receives a well bias voltage, and a P-type diffusion region P+, fig. 3b, formed in the vicinity of the pad; a first P-well (P-substrate) adjacent to the first N-well, the first P-well including an insulating region (middle N-well) and at least one P-type diffusion region P+ that receives a ground voltage outside the insulating region; and a second N-well (right N-well) adjacent to the first P-well and including an N-type diffusion region N+ that receives the ground voltage, wherein the insulating region is a sub-N-Well (middle N-well) embedded with said first P-well and having an N-type diffusion region (N+) that receives an off mode control voltage for preventing a latch-up current, fig. 3b.

With respect to 'that receives an off mode control voltage for preventing a latch-up current', Ker discloses a structure recited in the reference is substantially identical to that of the claims, claimed properties

or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

Regarding claim 13, Kerr discloses the semiconductor device wherein the at least one P-type diffusion region P+ comprises a first P-type diffusion region P+ and a second P-type diffusion region P+, fig. 3b, and the first P-well comprises: a first sub-P-well (left P-substrate of middle N-well) located between the insulating region and the first N-well (left N-well) and including the first P-type diffusion region P+; and a second sub-P-well (right P-substrate of middle N-well) located between the insulating region and the second N-well (right N-well) and including the second P-type diffusion region P+.

Regarding claim 14, Kerr discloses the semiconductor device wherein the N-type diffusion region of the first N-well, the P-type diffusion region of the first sub-P-well, and the N-type diffusion region of the insulating region constitute a bipolar junction transistor which cuts off a current flowing from the first N-well to the second N-well.

The recitation of 'cuts off current flowing from the first well to the third well.' is only a statement of the inherent properties of the product. The

structure recited in the Ker's reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

Regarding claim 15, Kerr discloses the semiconductor device wherein the control voltage generates a backward voltage between a base and an emitter of the bipolar junction transistor composed of the N-type diffusion region of the first N-well, the P-type diffusion region of the first sub-P-well, and the N-type diffusion region of the insulating region.

With respect to 'a backward voltage between a base and an emitter of the bipolar junction transistor', the structure recited in the Ker's reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.



Regarding claim 16, Kerr discloses the semiconductor device wherein the well bias voltage applied to the N-type diffusion region of the first N-well is a power supply voltage, fig. 3b.

Regarding claim 17, Kerr discloses the semiconductor device wherein the insulating region of the first P-well has a structure that surrounds the first N-well, fig. 3b.

Regarding claim 19, Kerr discloses a method of forming a semiconductor device comprising: forming a first well (left N-well) connected to a pad, fig. 3b, to which an external pin is connected, the first well including a first-type diffusion region N<sup>+</sup> that receives a well bias voltage; forming a second well (second well comprises P-substrate in both side of middle N-well) adjacent to the first well, the second well including an insulating region (middle N-well) and at least one second-type diffusion region P<sup>+</sup> outside the insulating region; and forming a third well (right N-well) adjacent to the second well and including a first-type diffusion region P<sup>+</sup> that receives a first voltage, wherein the insulating region inside the second well along with the first-type diffusion region N<sup>+</sup> of the first well constitute a bipolar junction transistor, fig. 3b, which cuts off current flowing from the first well to the third well.

The recitation of 'cuts off current flowing from the first well to the third well.' is only a statement of the inherent properties of the product. The structure recited in the Kerr's reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially

identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

Regarding claims 20, 22, Kerr discloses the method wherein the at least one second-type diffusion region P+ outside the insulating region comprises a first second-type diffusion region N+ and a second second-type diffusion region P+, and the step of forming a second well comprises: forming a first sub-well (left P-substrate) between the insulating region (middle N-well) and the first well (left N-well), the first sub-well including the first second-type diffusion region p+; and forming a second sub-well (right P-substrate) between the insulating region and the third well (right N-well), the second sub-well including the second second-type diffusion region P+, wherein the insulating region having a first-type diffusion region N+, wherein the insulating region is a third sub N-well.

Regarding claim 21, Kerr discloses the method wherein the first and second sub-wells of the second well are P-wells (P-substrate), and the first voltage is applied to the second-type diffusion regions of the first and second sub-wells of the second well, fig. 3b.

Regarding claim 23, Kerr discloses the method wherein the first and third wells are N-wells (left and right N-well), fig. 3b.

Regarding claim 24, Kerr discloses the method wherein the first-type diffusion regions N+ are formed of N-type impurities, and the at least one second-type diffusion region P+ is formed of P-type impurities, fig. 3b.

3. Claims 1, 12, and 19 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 847059 to Tsuji et al.

Regarding claim 1, Tsuji discloses a semiconductor device in fig. 1 comprising: a first well 12 connected to a pad, fig. 1, to which an external pin is connected, the first well including a first-type diffusion region 18 that receives a well bias voltage, a second well 20 adjacent to the first well 12, a second well 20 including an insulating region 22 and at least one second-type diffusion region 30 outside the insulating region 22, fig. 1; and a third well 24 adjacent to the second well 20 and including a first-type diffusion region 28 that receives a first voltage, fig. 1, wherein the insulating region 22 inside the second well along with the first-type diffusion 18 region of the first well 12 constitute a bipolar junction transistor, which cuts off current flowing from the first well to the third well.

The recitation of 'cuts off current flowing from the first well to the third well.' is only a statement of the inherent properties of the product. The structure recited in the Tsuji's reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially

identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

Regarding claim 12, Tsuji discloses a semiconductor device in fig. 1 comprising: a first N-well 12 connected to a pad to which an external pin is connected, the first N-well 12 including an N-type diffusion region 18 that receives a well bias voltage, and a P-type diffusion region 16, formed in the vicinity of the pad; a first P-well 20 adjacent to the first N-well 12, the first P-well 20 including an insulating region 22 and at least one P-type diffusion region 30 that receives a ground voltage outside the insulating region 22; and a second N-well 24 adjacent to the first P-well 20 and including an N-type diffusion region 28 that receives the ground voltage, wherein the insulating region is a sub-N-Well (middle N-well) embedded with said first P-well and having an N-type diffusion region (N+) that receives an off mode control voltage for preventing a latch-up current, fig. 3b.

With respect to 'that receives an off mode control voltage for preventing a latch-up current', Ker discloses a structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical

processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

Regarding claim 19, Tsuji discloses a method of forming a semiconductor device comprising: forming a first well 12 connected to a pad, fig. 1, to which an external pin is connected, the first well 12 including a first-type diffusion region 18 that receives a well bias voltage; forming a second well 20 adjacent to the first well 12, the second well 20 including an insulating region 22 and at least one second-type diffusion region 30 outside the insulating region 22; and forming a third well 24 adjacent to the second well 20 and including a first-type diffusion region 28 that receives a first voltage, wherein the insulating region 22 inside the second well 20 along with the first-type diffusion region 18 of the first well 12 constitute a bipolar junction transistor, fig. 1, which cuts off current flowing from the first well to the third well.

The recitation of 'cuts off current flowing from the first well to the third well.' is only a statement of the inherent properties of the product. The structure recited in the Tsuji's reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation

or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 11 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6690067 to Ker et al.

Regarding claims 11, 18, Kerr does not the semiconductor device wherein the third well 60 constitutes a depletion-type MOS transistor.

A recitation of 'a depletion-type MOS transistor' of the claimed invention does not result in a structural difference between the claimed invention and the prior art, thus claimed invention is only an art-recognized suitability for an intended purpose, MPEP 2144.07.

### ***Response to Arguments***

7. Applicant's arguments filed 17 Jan 2006 have been fully considered but they are not persuasive. The Applicant argues that both Ker and Tsuji fail to disclose 'the insulating region' because the N-well (middle one) of Ker and N-well region 22 of Tsuji do not have the same structure as the 'insulating region' as recited in the claims. Furthermore, the Applicant asserts that as in claim 12 'an insulating region is a sub-N-Well embedded within said first P-well and has an N-type diffusion region. This is not persuasive because Tsuji discloses an insulating region is a sub-N-Well 22 embedded within said first P-well 20 and has an N-type diffusion region, while Ker also discloses 'an insulating region is a sub-N-Well (middle one) embedded within said first P-well (p-substrate considers to be a P-well) and has an N-type diffusion. Thus, the Examiner respectfully submits that both N-Well of Ker and Tsuji would meet the claim structural limitation. In addition, the Applicant does not exactly point out what the structural distinctions

of claimed invention vs. applied reference. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F. 2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993)

With respect to 'that receives an off mode control voltage for preventing a latch-up current', Ker discloses a structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Or where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and MPEP 2112.01. In addition, something that is old does not become patentable upon the discovery of a new property. The claiming of a new use, new function or unknown property, which is inherently present in the prior art does not necessarily make the claim patent-able. MPEP 2112.

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is

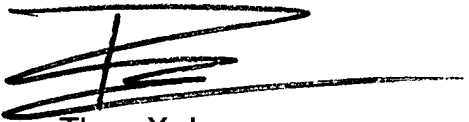


filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X. Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Thao X. Le', with a horizontal line extending to the right.

Thao X. Le  
10 Feb. 2006